Scribe Notes for 5th Surveillance Audit - August 2000

Element Audited: 4.1, Management Responsibility **Bldg/Rm: 4203/1201**

Issues/Observations: No issues/no observations.

Brief Summary of Interview:

- Directors were introduced to NQA's Lead Auditor.
- Minutes of MQC were reviewed by NQA.
- NQA Auditor asked about workforce status at MSFC. DE01 replied about MSFC's downsizing, and current actions for new hires, authority to hire approximately 190 new employees, 126 on-board. Then, DE01 explained the IPA process.
- NQA Auditor inquired whether, due to all changes in directives, if this is filtered down to all employees, especially the new ones. DE01 explained how MSFC ensures notices are sent electronically to all employees regarding all directive changes to ensure everyone's informed.
- Next, NQA commented about the small number of previous issues/observations. DE01 explained the process further; emphasizing how all open documentation is discussed, including issues and concerns.
- NQA Auditor asked about internal audits. DE01 explained how we layout a schedule for internal audits.
- NQA Auditor then asked about the MSFC Quality Policy. DE01 explained that it has not changed, and how it's on our badges.
- The NQA Auditor questioned the list of attendees at MQC meetings. DE01 explained that "01" following two alpha characters signifies that the individual is Director of a MSFC organization.
- The NQA Auditor asked about "To Do's" coming out of MQC meetings. DE01 explained the overall process, and then mentioned MSFC's calibration issue, how it got behind due to last year's Center-wide moves. CD01 spoke about how ISO 9000

has helped us improve our calibration, e.g., different categories of equipment have different requirements for frequency of calibration. Through ISO 9000 audits, a lot of equipment were discovered in the wrong category, and then these have been corrected. DE01 emphasized how we've gone down from over 5,500 items out of calibration to 88. DE01 also pointed out the link to safety since flying an item which wasn't properly calibrated could cause serious problems.

- The NQA Auditor asked about internal audits, and has this been discussed by management. DE01 said we haven't reached any show stoppers. TD01 mentioned how internal audits have helped STD. DE01 explained the process for MSFC internal audits and also noted that Center organization's are conducting their own internal audits.
- The NQA Auditor asked about ISO 9000-2000. DE01 mentioned an upcoming NASA-wide meeting at KSC in September 2000 to discuss the topic. DE01 also mentioned that plans are underway for deciding when MSFC should go forward with full scope.
- The NQA Auditor mentioned ISO 14,000, Environmental. CD01 commented they have begun considering the issue.

Element Audited: 4.17, Close-out of Prior NCR's
Bldg/Rm:4203/1201

Issues/Observations: No issues/no observations.

Brief Summary of Interview:

- The NQA Auditor reviewed actions taken to close-out prior NCR's:
- NCR # 1, was reviewed and closed by NQA.
- NCR # 2, Stamp Audit & Frequency, was closed by NQA.
- NCR #3, ASRI Contract File in Disarray: This file was reviewed in Bldg 4203/Rm. 1203, then later it was closed after a visit to the Procurement Office and review of

contract file NAS8-990096. {Note, a separate memo will be prepared to reflect the actual review, parties present, action taken}.

- NCR 1.1, Progress of site-wide System Access. The Audit Mgr explained how TD01 has not completed their corrective actions. TD01 is trying to combine this with another parallel action. The other organizations involved with this NCR have taken action to correct their appropriate process.

- The NQA Auditor verified that previous NCR # 3, ASRI Contract File in Disarray, could be closed. The Official Contract File, NAS8-990096, was examined and found to be organized.

- QS01 also explained that this area was looked at from a Center-wide perspective to ensure no systemic problems. Results of the review determined that files were generally organized.

- The NQA Auditor reviewed the schedule for Internal Audits & MPG 1280.6, rev. B, Internal Quality Audits.
- The MSFC Audit Manager formally introduced his new Assistant Audit Manager.
- The NQA Auditor asked if any Internal Auditors have been added to the list of available auditors. The Audit Manager stated "yes".
- The NQA Auditor asked if MSFC has added an Audit Plan. The MSFC Audit Manager explained that new policy is to have one audit plan for each audit, and the Audit Manager also mentioned that the MSFC Audit Schedule has changed mid-year, March through May audits had been completed.
- The NQA Auditor, after looking over the schedule, selected the following audit folders for review:

  (1) PS01, Procurement Audit: NCR's # 389, 390, 391, and 392 were reviewed. No issues noted.

  (2) ED01, Engineering Directorate Audit: the folder was reviewed, no issues noted.

(3) QS01, SMA audit: the folder was reviewed, no issues noted.

- During his review of audit files, the NQA Auditor and the MSFC Audit Manager discussed the following:

  (1) Audit Manager explained the process by which Lead Auditors & regular auditors must first serve as "under instruction" before they can actually participate in an audit.

  (2) The NQA Auditor asked to be shown where the "under instruction" policy is documented. The Audit Manager showed him the appropriate reference in MPG 1280.6.

  (3) The NQA Auditor asked about the 3 year record retention. The MSFC Audit Manager showed him NPG 1441.1 referenced in PG 1280.6 for Records Retention. Then, when requested, the Audit Manger provided the actual Schedule 5 of NPG 1441.1 which contained NASA's 9 year overall retention requirement. The Audit Manager explained the difference between the ISO 9000 3 year requirement and NASA's overall 9 year, which goes to records storage.

  (4) Next, the Audit Manager explained to NQA how each audit team is provided a list of previously closed NCR's to re-verify and ensure policy is still being followed.

  (5) The NQA Auditor briefly asked about the absence of statistical techniques in use at MSFC. The Audit Manager explained that, beyond the area being reviewed by the other NQA at the time of this audit, MSFC doesn't use these. The Audit Manager went on to explain that space hardware is built over many years, and generally only one piece of the hardware is built. So, since we don't manufacture thousands of similar parts, we don't utilize common "manufacturing" statistical sampling techniques for selection/sampling.

The NQA Auditor concluded the review of 4.17, Internal Audits, by stating that the MSFC Audit Manager had made tremendous improvements to the area, especially noting the detailed documentation of auditor's objective evidence.

PROSEDS PROJECT

Element 4.8 Product Identification and Traceability

Building 4705
Tether experiment is second stage of Delta Rocket.

Auditor: Show me the project. I need the overall scope
Auditee: We'll show you the boards
Auditor: Can I see the work order package?
Auditee: This is the work package for A3, A2 and A1 boards and discrepancy records associated with these. We have a few bad parts on board. There is a drawing that goes with the EPL. We have multiple versions of EPL.
Auditor: How do you know what is the latest?
Auditee: "A" is the latest
Auditor: How do I know its an "A" EPL
Auditee: A 101 is in the upper left-hand corner
Auditor: This is an "A" Drawing?
Auditee: This is a unique drawing, (Drawing No. 9GM182201-1 was referenced) This is for only one of these boards.
Auditor: Can you show me? Can I see?
Auditee: Here it is "A-1." You really don't want to pull it out.
Auditor: Are the boards built here?
Auditee: Yes.
Auditor: How many?
Auditee: 2 sets of 3 cards, S.N. 101 and 102. They are built in the Electrical Wiring Shop.
Auditor: Are they bea??? other boards?
Auditee: Okay, this is S.N. 102. This is the work order #OOV-1167-A; In 8 Rep. Q-615, Part #MSS 1959. We lay out parts kitted to build board that are receiving parts tags.
Auditor: What is the intent of the parts tags?
Auditee: For traceability – engineering paperwork and master parts list
Auditor: Where is it required for document traceability?
Auditee: Work Instructions – ASRI
Auditor: Who stamps inspections?
Auditee: ASRI.
Auditor: I see some line-outs without initials. Why?
Auditee: It is an alternate machine screw.
Auditor:: The I.D. or tracing number has been done without initials and dates. They had an Option to go –1 or –2?

Auditee: Right.
Auditor: Even here there are some line-outs
Auditee: These are work order drills that cover their paper work
Auditor: Can I see the Inspection Report? (Report for QQQ 500, Part tag # LT580/UH/883C referenced)
Auditee: We can go back to the receipt document to trace.
Auditor: So you have inspection reports for these also?
Auditee: Yes.
Auditor: Can I see?
Auditee: (Report for PT-KKK-603; part number RNC55J1003FS referenced)
Auditor: Can I see more? Can I see the big board – S/N 02-4?
Auditee: They kit all parts. That is the kit number for ASRI system. These are serial numbers for all boards PDI Lot #99-33, S/N 02-4.
Auditor: You have these over here. Were they all together?
Auditee: We have a test procedure.
Auditor: How do I know you're using the right box?
Auditee: This is the prototype chassis. I can show you.
Auditor: I'd like to see it.
Auditee: Okay. The originals are run with signatures. This is the procedure that we verify that the chassis is correct. This prototype is 002. This is the configuration of that chassis. (Referenced Procedure #MSFC-FC PROSEDS 302, "Checkout Procedures")
Auditor: What is your job title?
Auditee Electrical Parts Test Lab Lead
Auditor: What is your title?
Auditee :Quality Assurance Specialist
Auditor: Has there been a revision to this document? Can you show where this has been signed off?
Auditee: We verify each page. Each is stamped by the test conductor - signed and dated. The original that is received is maintained in Quality Records.
Auditor: Who is the inspector?
Auditee: ??????????? is her number. Quality has the record.
Auditor: Is there a date associated with this?
Auditee: Yes – 4/21/00. This is 303 Rev. A. We started it on the 21st and restarted it on today.
Auditor: Did you have to replace parts yourself?
Auditee: No - we put it back.
Auditor: U1 part replaced?
Auditee: This is the part tag number AAN814 (stamped) for the good part, Part #LMC 649BEN.
Auditor: Where is the DR number?
Auditee: F/N8; alternate BEN. They used the alternate LMC 649BEN. When you've matched the correct tag with the chassis, when we finish testing, it is coated. We

then test one more time. We verify that it works – torque it and test it within a few months.

Auditor: Where are all of these tasks called out?

Auditee: We document that everything is carried out. Boards that are finished products will be installed in a flight chassis.

Auditor: How many other projects?

Auditee: X-38. Not flight hardware – just for testing. We do have PROSEDS cables.

Auditor: Let's see.

Auditee: This is a W-10 PROSEDS Cable Assembly. This is the work order.

Auditor: Is it physically identified?

Auditee: Yes. Here are the drawings, test requirements, Work Order No. (W-01636/1; Drawing No. 96MOO310; P11131).

Auditor: What about No. 10 on the diagram?

Auditee: Here is the MJ-301

Auditor: Is it released yet?

Auditee: It could be in the Repository.

Auditor: Who is the ISO Rep?

Auditee: Sid Saucier.

Auditor: What is the quality policy?

Auditee: To provide quality products and services to our customers.

Auditor: Do you have any near finished or finished goods ready to be shipped out?

Auditee: We don't serialize everything. We have P.O. #SF495-00; IAR #01555, G-limit parts. Inspection Acceptance Records; P.O. Itemized (Qty) Project; Quality Requirements, applies to everything in Procurement.

Auditor: How many different parts? Have you checked on them? What Work Instructions apply to QS20 Q-A-0001?

Auditee: It tells us the create/deadline date. The forms are preprinted.

Auditor; What if the same part came in twice?

Auditee: There will be a different tag. Parts go to Building 4723 Store Room. We've started tags. Here is PTHAAU602 for P/N CDR02BX103BKUS; Lot #0029TD. The original white tag goes to the Quality Office.

Auditor: If I were to go to this other building (4723 Parts Warehouse), would I find these part numbers or tag numbers over there?

Auditee: Yes.

Building 4723, Room 111 Secured Component Storage Facility (Limited Access)
Auditee: ????????

Auditor: What procedures apply to this facility?

Auditee: Work Instructions 4530.1, Flight Hardware Support Operations Traceability and identification provided.

Auditor: Do you have product identification requirements?

Auditee: It is specified on the procurement request.
Auditor: What document do they need to get material out? Do you have a staging area?
Auditee: Material is received through Room 120; Material Request; Issue ticket or order
Auditor: Do you have an example of a material request?
Auditee: These are residual items we are placing in storage.
Auditor: On a completed issue, how can you show that it was completed and issued?
Auditee: ??
Auditor: Do you do your own purchasing?
Auditee: Yes. This is INR 264, Part Number SF499-00 M85049 38517N for UPA Project nonflight part.
Auditor: Is there a unique work order number?
Auditee: DALUPA0016R for Part No. M85049/38S17N, Qty. 1, partial
Auditor: How do you know its just a partial?
Auditee: The system will show what item number has issued.
Auditor: What is this?
Auditee: Issue slip to ?????? for part for OGA Project; Request KCOGA 26 Rev. A.
Auditor: Paperwork?
Auditee: Traceability documents, ADP, Package slip, calibration date, certificate of compliance, drawings, specifications, test results, etc.
Auditor: On the Certificate of Compliance, where is the part number?
Auditee: (Auditee shows auditor the part number on the certificate of compliance)
Auditor: Are there any other projects? Where is the stuff waiting for storage with parts tag?
Auditee: We don't have any.
Auditor: Can I see the parts tag?
Auditee: Located on computer, Tag No. NZGA-LG-17-24, Asset #F5323 from bin 3G1B.
Auditor: Could you get this record for me?
Auditee: Yes.

Building 4707 –Nozzles; Auditee: (Ceramics/Glaze Team Lead)

Auditor: How do you identify the nozzles?
Auditee: Each unit has a number, for example, 60K-56
Auditor: What is the status?
Auditee: It has been through the tape-wrapped linear machine IAW OWI for ED34 OWI-015 Rev. A. Each nozzle has its own shop travel book.
Auditor: Are there any others?
Auditee: Yes. In storage in Building 4705.

August 31, 2000 8:30am - 9:45am
Building 4471 / Room A119

The auditor began by asking to see MPG 1280.4 and MWI 1280.4. The auditor then asked to see QS10-R-012, the revision was the same as the auditor last visit. The auditor then asked to

see the RCAR Status List. He then viewed RCAR #162, 161, and 155. #155 had been through the DCB last week. The auditor requested to see an "old" one that was still open. He viewed RCAR #88, that was dated 8/22/88. This particular RCAR had a history with some assigned actions that were not recorded in the database. ????????????? had requested that a minimum set of rules needed to be established for Test Readiness Reviews that would apply to the whole Center. ?????????????????) and Mr. ??????? were assigned action to come up with this. This action was not recorded in the database.
The Record Investigation was viewed for this RCAR.
This was noted as an issue by the auditor at the Exit Briefing.
?????????? (HEI) (CAS/RCAR Assessment Engineer) was brought into the audit interview. He is currently being trained by ???????????? and in the transition this information may not have been put in the database.

The auditor then looks at the Monthly Status Report.
The auditor reviews Section 2 of MPG 1280.4
The auditor reviews the August 7 report (July 31 Monthly Status)

The auditor then wanted to review RCAR's that were open during his last visit. The RCAR's that he noted were #62, 126, and 143. All had been closed since the auditor's last visit.

The auditor then viewed the bottom of the list to see RCAR's that were colsed out most recently. #160 was closed on 7/31/00 (response date)

The auditor viewed RCAR#136.

The auditor viewed MPG 1440.2 Rev H.

There were no recorded customer complaints since last audit visit. There were 4 comments put in the system and the auditor viewed all of these. (120, 121, 122, and 123).

The auditor now viewed the PRACA System Procedure (QS10-R-005) REV B. The auditor now wanted to see items generated since last NQA visit. ????????????? searched for items dating between 4/1/00 to 8/1/00. 44 new open items and 77 new closed items. It was noted that some items get closed more that once. The auditor wanted to see a recently closed PRACA item.
Viewed A17604. Then viewed #17586, which was "Temporarily closed". Auditor wants to see paper copies of items he has viewed on the computer. He wants to see the documentation that addresses the temporary closure. QS10-R-005 section 4 addresses this. NSTS 08126 (viewed REV G dated 2/8/96) shows how to actually implement a temporary closure and gives the Interim closure criteria.

Auditor now viewed A17604 againg and noticed a discrepancy in the MISC H field in the database. <u>This was another issue for the auditor: inconsistency in using codes.</u> The auditor

asked to see the PRACA codes list. On his last visit he had noted that he had viewed one dated 4/5/96.

The auditor wanted to see the latest PRACA that had been opened. Viewed A17613.

Building/Room: 4707 / high-bay area

(Auditee leads us around touring the facilities and showing hardware for the MCC1 Nozzle. Auditee shows procedures and explains manufacturing processes.)

N Examines the documentation and asks to see a specific DR.
A Explains that he doesn't hold these records, the contractor Thiokol keeps them. Shows auditor the procedures for Combustion Chamber Nozzle (30:1) S/N 60K-56.
N Searches through the files and notices that one of the steps to a test was missing a date and time, but it did have initials next to it. Are there other revisions of this doc.?
A This is revision A. He explains the process of testing (1st shift, 2nd shift, etc.)
N Now let's look at hardware at different stages. How does technicians know that they are using the latest process?
A Explains fabrication process and tells him that each specific test has its own set of procedures. A knew OWI is made for each test.
N Now let's talk to some of the guys that work on the hardware.
A Some of the people who work on the hardware are contractors and they have their own Quality System, so they-re out of scope, but we can talk to some civil servants. (Walks over to building 4712 to talk to some "workerbees")

These people were away on training, so we went to building 4612 to ED33 to talk to some people who work with "Plating". There was no one available, so we went to talk to some software people in ED14.

Building/Room: 4487 / A-173

N Walk me through your process control procedures.
A We have an OWI to explain our process. (ED14-SS-001 Rev F) Titled "Software Development Process Description Document". Explains this process to auditor. Also shows supporting documentation (SLS-UPA-003, dated April 9, 1999.) Titled "UPA-FCA Software Development Plan".
N Walk me through this document.
A Explains the documents control process, monthly status reviews, and development process.
N Do you have a flow diagram of this process?
A Yes, but it is not in the OWI. It is a working copy. "S/W Development Life Cycle".

He explains the different phases of the process (PDR, CDR, SWTRR, and AR). TRR is Test Readiness Review.

N May I suggest that you put that flow diagram into your procedures. It really makes it easier for people unfamiliar with the document understand the information. Now my time is running out, but I would like to talk to you again about this UPA-FCA project. I would like to focus on the software design process. What is the quality policy?

A Paraphrasing the policy, and also told him that Sid Saucier was the ISO Mgmt. Rep.

N Now where do you fit in with ISO?

A I think we fit in well by following the correct procedures.

N Do you use object-oriented coding design?

A No, none of our projects use this method.

N I would like to talk to you tomorrow at 8:00am, would that be O.K.?

A Yes, we'll be here.

We went back to the plating area because we were informed that they had arrived.

Building/Room: 4612 / 1307

N What process do you follow in "plating"?

A We have several different processes, each one for a different type of plating.

N Name one process.

A Electroless Plating. Shows the plating procedures for this. ED33-OWI-009 Rev C.

N Are you currently doing any plating?

A No, we finished a job last week.

N May I see some of the paperwork with that job?

A Yes, let's go down to the lab. Show's ED33-2000-327B work order, etc.

N We are running out of time, I'll follow-up tomorrow at 10:00am to finish walking through this process.

August 31st, 2000 at 8:00am
Building/Room: 4487 / A173

A Gives auditor documentation to look through. SLS-UPA-002 dated 3/29/00. Titled "Software Design Specifications"

N Please explain your s/w design process. Walk me through this document.

A Explains process and shows a block diagram of the process.

N Let's start from your requirements and your statement of work.

A Shows UPA requirements document # MSFC-SPEC-3036. H/W & S/W Specifications dated 3/20/00. Shows traceability table and explains.

N Asks about reviews held to get to the detailed design phase.

A Tells auditor that PDR, and CDR's serve this function.

N May I see these documents?

A Those documents are kept in the project office. All we have are unofficial copies of the RIDs we generated. (Shows auditor the traceability requirements and explains psuedo-code and PDL.)

N Thanks. I would like to see this project again. (UPA-FCA) Make sure to get the PDR, and CDR documentation. I would like to also walk through the entire process with the project managers and see the quality records. I'll be back in 6 months.

Building/Room: 4487 / A173

N What phase are we in on this project (DCPCG)?

A In the middle of our verification process. Flight hardware and software. Verification is ¾ of the way finished.

N May I see your process documentation?

A Explains that project is still in the same phase, which is verification. The auditor talked with us on this stage last time.

N I'm at a disadvantage because I was not here last time, so could you bring me up to speed on this project? May I see your processes or any documentation that flows me through the entire process?

A Shows auditor the DCPCG project plan # MSFC-PLAN-2785 RevA. PDR was held on 2/6/98, and CDR was held in 7/99. The contractors are working on getting everything ready for the IRR. It is tentatively scheduled for mid November.

N Do we have any hardware built?

A The flight hardware unit is in verification testing, and the software is in testing.

N Asks questions about project scheduling.

A Explains that testing is being done at UAB. It is contracted out. Shows auditor PDR and verification documentation.

N Was there any software done in this review?

A Yes, explains.

N Do you have the minutes of the PDR and CDR reviews?

A Yes. (goes to get them.)

N Looks through PDR minutes. Asks about RIDs.

A Explains agenda of PDR, and talks about RID process, and Pre-board. The Pre-board meeting was held on 3/27/98.

N What's the next step after this?

A The CDR, and it also has a plan. Shows CDR plan and minutes.

N Asks to see the PDR minutes.

A Shows him the minutes dated 5/12/99.

N Where do you start the software design process?

A This is done at UAB which is in Birmingham.

N Do you get copies of their designs?

A We get high-level designs. Shows him the requirement document dated 4/24/00 RevB. This requirements document includes science, interface control, and performance requirements.

N Now let's look for the software section.
A Shows him the software interface requirements.
N Is there any testing done here?
A The only testing done here is environmental testing which includes: vibration, acoustics, off-gassing and toxicity. However; we do not do the testing ourselves. UAB contractors will be using our labs to do the testing.
N What is the date of the CDR?
A 5/12/99

Building/Room: 4612 / 1307

N Let's look at your processes.
A Shows nickel-plating procedures. ED33-OWI-009
N Do you have a checklist of procedures?
A Yes
N Asks to see hardware
A Shows Electroless-Nickel plating hardware. Titled "HERO".
N Auditor had no more questions.

THE END